1. Choose the interval below that f composed with g at $x = -1$ is in.

$$f(x) = -x^3 + 3x^2 + 4x \text{ and } g(x) = -4x^3 - 4x^2 + 4x + 3$$

A. $(f \circ g)(-1) \in [-7, -4]$

B. $(f \circ g)(-1) \in [-3, 1]$

C. $(f \circ g)(-1) \in [3, 10]$

D. $(f \circ g)(-1) \in [-12, -8]$

E. It is not possible to compose the two functions.

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2. Choose the interval below that f composed with g at $x = 1$ is in.

$$f(x) = -2x^3 + 2x^2 - 2x \text{ and } g(x) = x^3 - 2x^2 + x$$

A. $(f \circ g)(1) \in [-0.7, 1.9]$

B. $(f \circ g)(1) \in [-16.8, -11.2]$

C. $(f \circ g)(1) \in [-5.9, -3.1]$

D. $(f \circ g)(1) \in [-19.7, -15.7]$

E. It is not possible to compose the two functions.

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3. Determine whether the function below is 1-1.

$$f(x) = 15x^2 - 189x + 594$$

A. No, because there is an x-value that goes to 2 different y-values.

B. Yes, the function is 1-1.

C. No, because the range of the function is not $(-\infty, \infty)$.

D. No, because there is a y-value that goes to 2 different x-values.

E. No, because the domain of the function is not $(-\infty, \infty)$.

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4. Find the inverse of the function below. Then, evaluate the inverse at $x = 8$ and choose the interval that $f^-1(8)$ belongs to.

$$f(x) = \ln(x - 2) - 5$$

A. $f^{-1}(8) \in [442414.39, 442417.39]$

B. $f^{-1}(8) \in [22016.47, 22027.47]$

C. $f^{-1}(8) \in [15.09, 25.09]$

D. $f^{-1}(8) \in [396.43, 399.43]$

E. $f^{-1}(8) \in [442405.39, 442412.39]$

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5. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 15$ and choose the interval that $f^-1(15)$ belongs to.

$$f(x) = \sqrt[3]{4x - 3}$$

A. $f^{-1}(15) \in [843.5, 844.8]$

B. $f^{-1}(15) \in [-847.1, -843.8]$

C. $f^{-1}(15) \in [841.1, 843.1]$

D. $f^{-1}(15) \in [-843.1, -839.4]$

E. The function is not invertible for all Real numbers.

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6. Find the inverse of the function below. Then, evaluate the inverse at $x = 9$ and choose the interval that $f^-1(9)$ belongs to.

$$f(x) = e^{x+4} - 3$$

A. $f^{-1}(9) \in [-1.44, -1.23]$

B. $f^{-1}(9) \in [-1.58, -1.46]$

C. $f^{-1}(9) \in [-0.58, -0.38]$

D. $f^{-1}(9) \in [-1.36, -1.19]$

E. $f^{-1}(9) \in [6.47, 6.65]$

7. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = -11$ and choose the interval that $f^-1(-11)$ belongs to.

$$f(x) = \sqrt[3]{2x+4}$$

A. $f^{-1}(-11) \in [-663.5, -660.5]$

B. $f^{-1}(-11) \in [662.5, 664.5]$

C. $f^{-1}(-11) \in [-674.5, -665.5]$

D. $f^{-1}(-11) \in [664.5, 668.5]$

E. The function is not invertible for all Real numbers.

8. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = 8x^2 + 8 \text{ and } g(x) = \sqrt{3x+15}$$

A. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-6, -1]$

B. The domain is all Real numbers except $x = a$, where $a \in [0.83, 5.83]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-0.6, 8.4]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-9.67, -1.67]$ and $b \in [-3.75, 1.25]$

E. The domain is all Real numbers.

9. Determine whether the function below is 1-1.

$$f(x) = (5x - 18)^3$$

A. Yes, the function is 1-1.

B. No, because the range of the function is not $(-\infty, \infty)$.

C. No, because there is a y-value that goes to 2 different x-values.

D. No, because the domain of the function is not $(-\infty, \infty)$.

E. No, because there is an x-value that goes to 2 different y-values.

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10. Add the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = 9x^3 + 8x^2 + 6x \text{ and } g(x) = \sqrt{-3x + 10}$$

A. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [4.5, 10.5]$

B. The domain is all Real numbers except $x = a$, where $a \in [-8.25, 0.75]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [3.33, 4.33]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [3.75, 5.75]$ and $b \in [-6.2, -3.2]$

E. The domain is all Real numbers.
